

Claims

1. Isolated protein comprising the same or substantially the same amino acid sequence selected from the group consisting of SEQ ID NOs: 1 to 12, or a splice variant or a salt thereof.

5 2. Protein according to claim 1, which comprises at least one fragment of said amino acid sequences.

10 3. Nucleic acid, which comprises at least one nucleic acid encoding a protein according to claims 1 and/or 2.

4. Nucleic acid according to claim 3, which consists of DNA or RNA.

15 5. Nucleic acid according to claim 4 comprising a nucleic acid selected from the group consisting of SEQ ID NOs: 13 to 24.

6. Nucleic acid according to one of claims 3 to 5 further comprising at least one promoter, enhancer, intron and/or polyA-sequence.

20 7. Nucleic acid, which is complementary to the nucleic acid according to one of claims 3 to 6.

25 8. Vector comprising a protein according to claims 1 or 2 and/or a nucleic acid according to one of claims 3 to 7.

30 9. Vector according to claim 8 selected from the group of vectors consisting of plasmids, phagemids, phages, cosmids, artificial mammalian chromosomes, knock-out or knock-in constructs, viruses, in particular adenovirus, vaccinia virus, baculovirus, retrovirus, adeno-associated-virus, rhinovirus, HIV, adeno-associated virus (AAV), herpes simplex virus (HSV-1), lentivirus, filovirus and engineered versions thereof, naked DNA, virosomes, liposomes, nucleic acid coated particles, in particular gold spheres.

10. Isolated cell comprising a protein according to claims 1 or 2, a nucleic acid according to claims 3 to 7 and/or a vector according to claims 8 or 9.
11. Cell according to claim 10, which is a stem cell, a neuronal precursor cell or a neuronal cell, in particular an axon.
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12. Transgenic non-human animal generated from a cell according to claims 10 or 11.
13. Antibody directed against a protein according to claims 1 or 2.
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14. Method of producing a protein according to claims 1 or 2 and/or a nucleic acid according to claims 3 to 7 comprising the steps of:
 - a) cultivating a cell according to claims 10 or 11, and
 - b) isolating said protein and/or said nucleic acid.
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15. Method of isolating compounds interacting with a protein according to claims 1 or 2 comprising the steps of:
 - a) contacting said protein with at least one potentially interacting compound,
 - b) measuring binding of said compound to said protein.
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16. Method according to claim 15, further comprising the steps of:
 - a) selecting a binding compound,
 - b) modifying the binding compound, to generate a variety of modified binding compounds,
 - c) contacting said protein with each of the modified binding compounds,
 - d) measuring binding of said modified compounds to said protein, and
 - e) if needed repeating steps a) to d) for one or more times.
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17. Method of isolating functional interactors comprising the steps of:

5 a) contacting a neuronal cell that comprises a wt nucleic acid coding for a protein selected from the group consisting of SEQ ID NOs: 1 to 12, a splice variant thereof, or a fragment thereof with a potential functional interactor,
 b) contacting the cell with a bioactive lipid phosphate, and
 c) measuring neurite movement.

10 18. Method according to claim 17 further comprising the steps of:

15 a) contacting a neuronal cell that comprises a mutant nucleic acid coding for a mutant of the protein selected from the group consisting of SEQ ID NOs: 1 to 12, or a splice variant thereof or that contains a knock-out of the wt nucleic acid coding for one of said proteins with a potential functional interactor,
 b) contacting said cell with a bioactive lipid phosphate, and
 c) measuring neurite movement.

20 19. Method according to claims 17 or 18 further comprising the steps of:

25 a) selecting a functional interactor,
 b) modifying the functional interactor, to generate a variety of modified functional interactors,
 c) contacting a neuronal cell as used in claim 17 a) and if needed a cell as used in claim 18 a) with each of the modified functional interactors,
 d) contacting said cell or cells with a bioactive lipid phosphate,
 e) measuring neurite movement, and
 f) if needed repeating steps a) to d) for one or more times.

30 20. Method according to one of claims 15 to 19, further comprising the step of admixing the interacting compound or the functional interactor with suitable auxiliary substances and/or additives.

21. Pharmaceutical composition for the treatment of neuronal injuries or diseases comprising a protein according to claims 1 or 2, a nucleic acid according to claims 3 to 7, a vector according to claims 8 to 9, a cell according to claims 10 to 11, an antibody according to claims 13, a binding compound isolated by the method of claims 15 or 16

and/or a functional interactor isolated by the method of claims 17 to 19 and if needed suitable auxiliary substances and/or additives.

22. Use of a pharmaceutical composition of claim 21 for the production of a medicament
5 for the treatment of neuronal diseases or injuries, including spinal card lesions, head traumata, Alzheimer disease and stroke.
23. Use of a protein according to claim 1 or 2 or a nucleic acid according to claims 3 to 7 as a diagnostic marker for the diagnosis of a disease or disease state.
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24. Use according to claim 23, where the disease is a neuronal disease, a tumor disease or infertility.